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THE GENESIS OF THE CATEGORIES

I

PRAGMATISTS have always contended that the categories, the general and basic principles of thought in terms of which all our experience is organized, such as space, time, thing, person, number, identity, contradiction, substance, causation, and truth, are at bottom instrumental and functional. They have come into existence, persisted, and come to dominate all our thought and to appear as self-evident principles simply because they have been so eminently successful in organizing human experience and making possible the carrying-out of human purposes and solution of human problems that it now seems impossible that man ever could or would dispense with them.[1] While, however, pragmatists have always thought of the categories as instrumental and functional in the biological, and more particularly the psychological sense, they have hitherto been forced to describe them schematically in the terminology of formal logic as "postulates" or "hypotheses," expressions never intended to be taken literally, and merely employed in default of knowledge of the historical details of their actual psychological development.[2]

Recent developments in psychology and sociology have now rendered it possible to trace some of the main features of the psychological evolution of the categories from a pragmatistic standpoint. In outlining these, the writer can hardly hope that all of what he has to say will accord with all of the divergent opinions of individual pragmatists, but he trusts that it will indicate a general method of treatment of this problem that will meet with their approval. In

[1] This common pragmatistic doctrine is found in James's "Pragmatism" and "Meaning of Truth," and, though less explicitly, it appears in connection with the discussion of hypothesis in Dewey's "Studies in Logical Theory" and "Influence of Darwinism on Philosophy." Dr. F. C. S. Schiller, however, deserves the credit for developing this side of pragmatism most fully, in "Axioms as Postulates" (an article in a volume of essays edited by Start and entitled "Personal Idealism"), and in his recent "Formal Logic."

[2] Schiller, "Axioms as Postulates," pages 122–124.

avoiding polemic, he does not wish to convey the impression that he regards pragmatism as an established doctrine, but rather that constructive exposition is probably at the present time the better way of winning converts to the pragmatistic faith.

It is now safe to say that before *Pithecanthropus alalus* evolved into primitive man by learning to speak and to think, and by devising categories to assist him in the process, he already possessed anticipations of some of our categories in the organizations of his sense percepts. Many animals discriminate accurately and precisely the positions of different objects, and find their way home over long distances of space and during considerable time intervals. As no one would credit animals with the possession of the categories of thought, this capacity must be attributed to the nature of their sense percepts and coordinated motor responses. We must also credit to animal perception the capacity to discriminate between animate and inanimate objects, since they manifest a mechanical mode of behavior toward the latter which is in sharp contrast with the anthropopathic behavior exercised toward other animals and toward human beings.[3] In a certain sense, therefore, the distinctions involved in some, at least, of the categories, *viz.*, space, time, thing, and person, are present in the sense percepts of animals. It is reasonable to suppose that if it were possible to eliminate the thought elements that are fused with immediate sense perception in human adult experience that we should find similar qualities or relations or elements or functions—call them what you will—in the pure percepts of human beings. However this may be, it is clear that historically and phylogenetically perceptual elements anticipatory of some of the categories existed prior to the genesis of thought.

What is the functional significance of these perceptual elements from the point of view of pragmatism? It is clear that their pragmatic significance is different from that of the categories. Though instrumental, they are so in a different sense. These perceptual elements have persisted because they are functional in a strictly biological sense. Due originally to spontaneous or Mendelian variations or what you will, the individuals whose behavior was perceptually organized in terms of them were better equipped in the struggle for life, and so survived as a result of natural, or perhaps of organic, selection. The perception of things or objects is functional in a second sense, also. What, for the same animal, would be one object upon one occasion might be several objects upon another occasion. For instance, a bunch of grapes might be perceived as a single object by a hungry monkey if he could grasp them all at

[3] J. H. Leuba, "A Psychological Study of Religion," New York: 1912. Chap. III., and the literature therein cited.

once, whereas they would be separate objects if he could only pluck them one by one through the bars of his cage. What will be perceived as a thing or object, therefore, varies according to the practical demands of a situation.

These perceptual anticipations as they exist in animals differ from the categories of human thought in two very important respects. In the first place, while the animal can pass successively from one place to another in the direction of home, guided by successive sense stimulations, and in this sense the space of its past experience is organized for it into a system, this system is probably never present before its imagination in ideas subject to its control, so that it can pass freely from one image or idea to another.[4] Still less, in the second place, can it communicate or cooperate with others, except to the extent that they are likewise stimulated by successive sense stimuli evoking similar reactions. Animals do not form societies in the human sense.

Men, then, notably differ from animals in the possession of free images and ideas and in the capacity for social life. When primitive men first came into possession of free images and ideas, and, as gregarious animals, felt the impulse to use these images and ideas to serve the purposes of their social life, they were confronted by the problem that provoked the formation of categories.

The most convenient example for us to consider first is the category of space. Newly possessed of free images and ideas, primitive men were conscious, not only of the objects of immediate sense perception at a given moment, but also of images of all sorts of other objects which they had perceived before, or only dreamed of or otherwise imagined, but which had spatial characteristics like perceived objects. Hence, some method of control of these images, so that they might be consciously thought of in relation to objects immediately perceived, became necessary. Moreover, this method of control must be some common standard or medium, the same for every one in the tribe, so that all could understand one another and cooperate for common purposes. The most available cognitive material which they had was utilized for the purpose, and, in the case of various native races reported to us, this was the tribal camp. If the camp consisted of four divisions, each allotted to a clan or phratry, the rest of space was divided into four grand divisions, each beginning with the space occupied by one of the clans and extended outward indefinitely, and associated in some sense with the clan

[4] At least beyond a very limited extent. Cf. S. J. Holmes, "The Evolution of Animal Intelligence," Chaps. XII. and XIII.; M. F. Washburn, "The Animal Mind," Chaps. XI. and XII.

totem.[5] The Zuñi Indians have a very elaborate conceptual space divided into seven divisions corresponding to the original seven clans of their pueblo.[6] When the tribal camp is circular in form, as among the Zuñis, the whole of space is an immense circle. The original significance of the Latin *mundus* and the Greek κοσμος seems to have been similar in principle.[7]

The differentiation of numbers above three or four is preceded by the use of concrete objects and portions of the body in calculations, a fact indicating that numbers are devices invented after men already knew how to calculate in order to facilitate the process.[8] Both localities and numbers begin by being discrete, each with its own sacred and magical attributes, and space and numbers only become abstract and homogeneous media of thought with later evolution. So we may claim that the evolution of these categories has gone on strictly in accordance with pragmatic principles. As situations and emergencies arose out of the conditions of social life, the categories were revised and further differentiated in order more effectively to solve social problems and realize social ends. Their thoroughly functional and instrumental nature is evident.

The social and instrumental origin of the categories explains why the evolution of some of them was retarded in a manner that would otherwise be unaccountable. Animals consistently distinguish between animate and inanimate objects in their perception, and adopt different modes of behavior accordingly. Why was primitive man unable to maintain this distinction in his sense perception, and to extend it to his free images and ideas, and organize his categories to that end? The problem of utilizing memory images of objects in their absence from perception would seem at once to have suggested comparison, and to have developed the laws of identity and contradiction. Such would doubtless have been the case had the evolution of the categories come directly from mechanical behavior, as we should logically suppose to have been the case. But, as a matter of fact, the evolution of the categories came rather illogically, following a devious route beginning with anthropopathic behavior. This was because primitive man's chief interest and attention was not so often directed towards inanimate as towards animate objects. The latter affected him in more different ways, and more intensely. Had

[5] Durkheim and Mauss, "Année Sociologique," VI., page 47 ff.; E. Durkheim, "Les formes élémentaires de la vie religieuse" (Paris: Alcan. 1912), pages 15–17.

[6] F. H. Cushing, "Zuñi Creation Myths," in 13th Report of the Bureau of American Ethnology.

[7] F. M. Cornford, "From Religion to Philosophy," page 53.

[8] L. Lévy-Bruhl, "Les fonctions mentales dans les sociétés inférieures," Chap. V. Paris: Alcan. 1912.

interests involving mechanical behavior prompted man to attend chiefly to inanimate objects he would soon have learned to reckon upon the constant appearance of the same properties of objects under the same conditions, and to expect these to reappear to all other persons under the same conditions. Animate objects, however, do not reveal any such uniformities in so obvious a manner. There is not perfect uniformity in their behavior; their moods change, and some persons know things that others do not. So savages believe in metamorphoses, and in the existence of properties and objects that can be perceived only by certain persons, or by none at all.[9]

This explains why many savages, if they possess them at all, do not employ the principles of identity, contradiction, and causation in a manner at all comparable with ourselves. Instead, they make very large use of another category which Professor Lévy-Bruhl calls "the law of participation"[10]—a kind of mystical category, partly cognitive, but partly affective, which it is difficult for us with our more differentiated and better controlled cognitive and affective states to understand. It is perhaps better to describe this law than to attempt to define it. Totemism furnishes illustrations of it. The Bororó of Brazil identify themselves with their totem, and see no difficulty in affirming that they are at the same time human beings and araras, a species of birds with red plumage. The *intichiuma* ceremonies of the Australian tribes reported by Spencer and Gillen imply a communion of essence in which the actual individual, the ancestral being which lives in him, and the animal or vegetable species which is his totem, participate. Whereas for our mentality these are necessarily three distinct realities, for the Australian the three are one only at the same time that they are three. The very word "to be" has a different meaning at this stage of culture from what it has for us.[11] For these savages it envelopes representations and the consciousness that experiences them in a kind of participation *felt* and *lived* rather than thought. It renders it possible for objects to be, in a manner hard for us to grasp, at the same time themselves and something other than themselves. The opposition between one and many, the same and the other, does not at this level impose the necessity of affirming one of these terms if one denies the other. At a higher level, after the felt unity of the tribe with the totem group has become less intense, and the principles of identity and contradiction more as we understand them, begin to emerge, we find tribes reported that are unable to believe that they can at one and the same time be men and totemic plants and animals.

[9] Lévy-Bruhl, *op. cit.*, pages 40–45; 58–67.

[10] *Idem.*, Chap. II., and *passim.*

[11] *Idem.*, page 94.

For them the totemic emblem has become symbolic rather than literal and some sort of intermediaries must effect the union. The participation, in other words, is *represented,* and no longer immediately felt. When the Bororó reach this stage, Lévy-Bruhl predicts that they will no longer say that they are araras, but that their ancestors were such, that they are of the same essence with the araras, that they will become araras after their death, etc.[12]

The functional nature of the categories is evident in this. At the lowest level, savages employ the category of participation because it meets the needs that they consciously feel, and is serviceable in satisfying them. The individual is hardly conscious of his individuality as such, but he very vividly feels his unity with his clan and totem, and the law of participation expresses his feeling vividly and completely; it "works" in the pragmatic sense. At higher levels, where use is made of representative imagery, instead of mystical feeling to express the unity of the tribe with its totem, the explanation probably is that individualism is beginning to emerge. In many relations of life individuals have now become conscious of their separate interests, while in other relations they still feel the need of vivid appreciation of their tribal and totemic unity. Representative imagery and the higher level of analytic and synthetic thinking that accompanies it can distinguish between, and at the same time conserve, diverse values that immediate feeling could only fuse and confuse. So that in changed conditions, in response to changed demands, new thought categories, like identity and contradiction, "work" better because they can organize representations, and, therefore, supplant the felt category of participation.

The social and pragmatic origin of the category of cause and effect is equally evident. At the lowest level this category is so undifferentiated that it is impossible to identify antecedent and consequent and lines of necessary connection with any certainty. A chief in the Torres Straits could not understand why, one day, he was unsuccessful in fishing. Three or four days afterward an infant and two women in the village died. In his mind this explained the matter fully, and cleared him of all blame. As Lévy-Bruhl points out, it would be impossible in this case to say which was cause and which effect, since the unsuccessful fishing was explained by the deaths, and so you might say was the effect of them, while on the other hand it preceded them as if it were cause.[13] All kinds of metamorphosis and action at a distance are believed in. Men can be born of rocks, stones can speak, the dead can become alive.[14] At

[12] *Idem.*, page 431.
[13] *Op. cit.*, pages 333 ff.
[14] *Idem.*, pages 518–528.

this level we have to do with a felt or confused force, sometimes called by name, *mana, wakonda, orenda,* indicating a stage in which the category of causation has not yet become clearly differentiated from the law of participation.[15] Professor Durkheim maintains that this felt and at the same time impersonal force must be the collective force of society projected into physical objects,—or, as I think we might put it, it is anthropopathic behavior attributed to physical objects. His argument is as follows. (1) Such an idea of force could only come from felt inner experience, since the only forces that we can experience are those that we feel inwardly. The senses only reveal phenomena that succeed or follow one another, not force passing from one phenomenon to another. (2) This felt inward force can not be the individual's feeling of his own volition, for that would not seem to him to be an impersonal force. It therefore must be the feeling of social force or pressure, which would seem to the individual to be impersonal, since it is not due to any one in particular. When the category of cause and effect finally became differentiated, antecedent and consequent became discriminated, together with force and some sort of necessary connection. The last was the authority of society over the individual. When we think how the individual in the lower races is dominated by tribal customs at every hand, customs handed down from time immemorial for which nobody is responsible, we realize that the notions of force and necessary connection could arise in this way, and make possible the notion of causation.

We may, therefore, claim that the evolution of cause and effect has been what the pragmatist would expect,—a gradual development, prompted by human needs and purposes, of devices for the explanation and control of the outer world. When the race was young it devised tools from the vague feelings that constituted most of its inner experience, and invented the category of participation, which satisfied its desires for the time; when it had become more individualistic and discriminated better its representative images, it learned to distinguish antecedent and consequent and connected the two by the only impersonal tie of relationship that it knew, and this "worked" for a long time, and still "works" for ordinary men to-day. Finally, as a feature of the exact methods of modern natural science, highly abstract quantitative conceptions have supplanted the anthropomorphic notion of a causal force or efficacy, because the former furnish simpler and more effective tools for solving scientific problems. Nothing could be more thoroughly pragmatic than this evolution.

[15] Cf. also Irving King, "The Development of Religion," Chap. VI., and R. R. Marett, "The Threshold of Religion," Chap. IV., and *passim.*

Space does not admit the discussion of other categories, such as time, substance and attribute, genus and species, which Professor Durkheim and his school have analyzed along similar lines. Enough has been said to show their general implications. It should be noted that in the use that I have made of their investigations in outlining the character of the psychological genesis of the categories from the point of view of pragmatism, I have carefully avoided making the account in any way dependent upon certain of the more controverted positions of these writers, like the doctrine of collective representations, Lévy-Bruhl's theory of a pre-logical mentality fundamentally different from our own, and Durkheim's theory that the categories are of religious origin. I have also avoided every implication of the doctrine of a social mind or consciousness existing in any sense independent of individual minds as a separate entity. Whatever may be the fate of such doctrines, the evidence that the categories have had a social origin, and that they have varied greatly in different societies and different stages of culture, seems incontrovertible. That the categories should be interpreted therefore from the pragmatistic standpoint as instrumental and functional in their nature, serving to control and govern human experience and accomplish human purposes, seems almost a corollary.

II

It is now necessary to consider the category of truth. For, from the point of view of pragmatism, truth must also be regarded as a category. It is a schema or concept by means of which we organize our perceptual and imaginal experience in order to accomplish our ends. Its genesis can be outlined in a manner similar to the categories already discussed. Like causation, and unlike space and time, the distinction between truth and error is a purely thought distinction, not anticipated in sense perception. To be sure, animals sometimes experience perceptual illusions, but the distinction between truth and error implies some sort of norm or standard that could only have occurred to man after he was able to form judgments and make comparisons. When he was puzzled whether he could safely act upon a memory image, and decided whether or not to do so, he was consciously facing the problem of truth and error.[16] If the image led him to the results he desired, satisfied him, it was true; if it did not, it was false. *Any* sort of satisfaction following the acceptance of an idea probably made it true in the beginning.[17]

[16] Before the problem became so explicit as this, the formation of meanings must have begun in the manner described by Professor G. H. Mead, *Psychological Bulletin*, Vol. VII., pages 397–405.

[17] Perhaps savages who reply to a traveler's inquiry with the answer that

Very soon, however, man must as a rule in various fields of his conduct have learned to become more particular as to the kind of fulfillment an idea ought to have in order to be satisfactory. The physical environment is somewhat stiff and unyielding. Social requirements also bear heavily upon savages. The satisfaction requisite must soon have been referred to a social standard, and this must have included the other categories in the form that primitive men then possessed them. An idea to be true upon this second plane had to be verified by realizing its own intention and implications. Only on the first and lower plane can it be strictly said that "truth happens to an idea." On the higher plane the relation between an idea and its fulfillment must be more close and intimate.[18]

While truth, as it has been said, makes its appearance only with reflective thought, it has rather a definite instinctive foundation, more so than any of the other categories that we have considered. This is chiefly found in the instinct of curiosity and its accompanying emotion of wonder, which are prominent in the animals nearest to man.[19] They delight in watching whatever is strange and novel in their perceptual experience, when not restrained by some conflicting instinct, like fear. Primitive man's curosity, no doubt, was also evoked by whatever was strange and novel in the free play of his newly acquired free images and ideas; to him, as to us, reverie must have been a source of delight, and reverie I take to be the manifestation of curiosity with reference to the free play of images and ideas.[20] To employ the categories in the organization of novel perceptual and imaginal material, to work out *liaisons* and participations between things, to compare one idea with another and find points of identity and contrast, to devise causal explanations of things (at first no doubt as myths)—all such manipulation of images and ideas in terms of the categories must have been a delightful sport.

To be sure, most thinking done by individuals was and is

they think will please him, regardless of the facts, imagine, for the time being, that they are telling him the truth! The honest but over-enthusiastic salesman and the passionate but fickle lover are analogous cases.

[18] Professor Dewey's test of truth seems to me to be that of the second plane, while James's looser use of the pragmatic method corresponds to the more primitive plane. This latter has always survived to some extent, especially in the field of religion, where beliefs that would have been erroneous if tested by the standards of the higher plane have often survived, and in a sense "worked" by performing some social service. (Cf. Dewey, "What Does Pragmatism Mean by Practical?" this JOURNAL, Vol. V., pages 85–99).

[19] W. McDougall, "Social Psychology," pages 57–59; "Body and Mind," page 266.

[20] Professor Graham Wallas has convinced me of the very great importance of reverie in this connection, but it seems to me to be a mode of curiosity, and not a separate instinct or innate disposition.

prompted by other instincts than curiosity. All human instincts and sentiments on occasion demand the acquisition of knowledge (*i. e.*, the organization of percepts and images into an intellectual system by means of the categories). Very often curiosity is only the servant or auxiliary of other instincts, and, being evoked only to aid in their gratification, is easily satisfied with whatever thought material satisfies them. Such other instincts we call "practical" or "interested," in contrast with curiosity which is "disinterested." Probably there is no field of scientific knowledge or speculative thought in which the organization of images and ideas has not gone beyond the satisfaction of "practical" interests. Such truth, like all other, is instrumental and functional,—satisfying, as it does, human instinct. It is teleological in the sense that the instinct that prompts man to desire it is for his own good, and makes for his own survival; but the man devoted to research is often as unconscious of this fact as he is of the teleology of the sex instinct when he falls in love. It is "disinterested" only in the somewhat Hibernian sense that it does not subserve "practical" interests.

Since, like the other categories, truth is a social creation, it is probably safe to say that most of the content of ideas organized by modern social groups under the category of truth owes its origin to the "disinterested" instinct of curiosity. Beliefs whose origin is more "interested" as a rule are not trustworthy and do not long survive. They either bump up against stubborn perceptual facts, or they twist the categories so badly out of shape (by straining the laws of identity, contradiction, causation, etc.), that it costs too much to maintain them. So that while the thinking of most individuals at any given moment is prompted by other motives than "disinterested" curiosity, the content of the judgments that they utilize in their thinking is for the most part drawn from the storehouse of the accepted truths of their social group, and this storehouse is chiefly stocked with truths that in the first instance were the fruit of "disinterested" curiosity.

The impulse to seek the gratification of curiosity in isolation from other impulses has become fortified by a certain moral sanction. Man has learned that the sort of cognitive material that satisfies the instinct of curiosity independently can be relied on, as a rule, in the long run to satisfy other interests and impulses most completely and most socially. He therefore sometimes hypostasizes this kind of truth as "disinterested truth," "absolute truth," and "truth for its own sake." Wisdom, the mental habit or sentiment that prompts some men to seek such satisfaction along definite lines and makes them

efficient in so doing, early in moral evolution became a socially recognized virtue.[21]

The fact that truth is a social creation[22] explains various of its features. It explains why it is seemingly universal, objective, necessary, and sometimes sacred in character. It appears to the individual to be universal because it is a social possession, not his private property and not different for him from what it is for the other members of his group. It is no respecter of persons. It is objective to him for much the same reason. He has not made it; and only to a slight extent can even the greatest scientist hope to change it. It is necessary because it has all the authority of the group behind it, and the individual must submit to it, for society will tolerate no one that disregards many of its truths. Another reason why it is necessary is because most of the beliefs thought by individuals to be true have been half unconsciously assimilated by them through imitation and suggestion; and, to those who have never considered the reasons why they were incorporated into the social body of truth, they seem self-evident because no one has ever questioned them. They are often sacred, because they are assimilated under religious, patriotic, and other associations that involve deep emotional feeling and sentiment. How many Americans to-day in ordinary ranks of life know why they believe in monogamy and a republican form of government! To how many do these beliefs seem necessary and sacred truths about which it would be distasteful to argue in cold blood! Yet each of these truths is limited in its acceptance to certain social groups of a national character.

Truth to-day is of many kinds. As we have seen, it may or it may not be the satisfaction of a specific instinct or group of instincts.[23] There are truths and truths. In a broad way, a truth may be defined as any cognitive material that is affectively satisfying to a social group so that it may be employed as an instrument to action. Where the affective pull of "interested" impulses is strong, any cognitive material is liable to be satisfactory in this sense if it is agreeable to these impulses, and does not obviously resist organization under the categories or patently contradict sense perception. Such a social group as the Christian Scientists appears to be able to maintain beliefs that render them impermeable to a good deal of

[21] I have discussed the psychology of this and other virtues very summarily in an article in the *Philosophical Review*, July, 1913.

[22] The evidence that all the objects of thought, physical as well as mental, are social in their origin may be cited in the support of the view that truth is a social creation. Cf. George H. Mead, *op. cit.*, and E. S. Ames, "Social Consciousness and Its Object," *Psychological Bulletin*, Vol. VIII., pages 407–411.

[23] For a different view on this point, cf. Professor A. W. Moore, "Truth Value," in this JOURNAL, Vol. V., pages 429–436.

conflicting sense experience, and that probably come under the hoary law of participation, since they are irreconcilable with later categories. Such instances lie at one pole. At the opposite pole are the accepted principles of the more exact natural sciences, which have been clearly thought out in terms of the categories in their latest and most highly evolved forms, and have been thoroughly subjected to numerous perceptual and experimental tests. All of the accepted truths of modern society lie at one or the other of these poles or somewhere between. An adequate definition of truth must recognize these varying types. We can only deny the name truth to any accepted belief that satisfies a considerable social group by referring the belief to the standards of some other social group which we regard as superior. We may choose to reject the beliefs of the Christian Scientists because they conflict with natural science. In this case we identify ourselves with the natural scientists, choose to think in terms of their categories, and in consequence find the doctrines of Christian Science untrue. Truth, therefore, in the last analysis is what is thought to "work" because it satisfies the requirements of the highest social group to which we can appeal.

The categories, including under this term truth, have been treated as functional devices arising in human experience and aiding human societies to gain control of situations in which they find themselves so as to secure their ends. Is this not subjectivism?

It may be replied that if this conception deserves the name subjectivism, it is at least not individual, but social subjectivism. It is not solipsism, unless the Leviathan is the solipsist! The categories, as we have seen, are not the constructions of individuals. They are the accepted fundamental conceptions of an age, and only very gradually change from one age to another. They are the most permanent elements in human thought, and come to the individual with much of the universality and necessity that Kant attributed to them. It may therefore be said that the categories are real, if anything human is real. By means of them the members of human societies are able to adjust themselves to one another and to their physical environment, and to realize their purposes. They are real because they are effective instruments to action. This does not merely mean, as it seems to me, that they are real because they are postulates so valued by human beings that the latter would maintain their belief in them at whatever empirical cost, although it includes this. It further means that our experience has taught us that we may positively affirm that the universe, whatever its nature may be apart from us, is such that when human organisms come into experiential relations with it, their percepts and categories are fairly efficient in enabling them to effect an adjustment with it. It would

be too bold, however, to maintain, except as a postulate of faith (similar in principle to those of religion, though, perhaps, on the whole more consistently workable) that the categories in any constitutive or representative fashion interpret the universe as it exists apart from its interaction with human organisms. Surely the social subjectivism, if such it be, of this form of pragmatism deserves commendation for honestly confessing that there are limits to possible knowledge, and for not, like certain rival forms of contemporary philosophy, advancing specious arguments based on the impossibility of doubt, the ego-centric predicament, and the like, and claiming that our human categories are laws of things in themselves.

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DISCUSSION

THE LAW OF THE RESTING POINT

IN a recent paper[1] Dr. Hollingworth has advanced a most interesting principle of normal perception which he calls the law of the resting point. The facts he adduces in favor of this principle seem to me to be, in the main, both accurate and significant. Their bearing upon the theory of perceptive processes is less obvious than their relation to the technique of the pictorial arts; but that they do throw light upon the former, I can not but believe.

I am inclined to conjecture, though, that they do not throw the particular illumination which Dr. Hollingworth turns on. And I wish here to discuss his interpretation of his data because I believe that it supplies us with an exceedingly sharp contrast between two radically different modes of psychological explanation. The mode chosen by Dr. Hollingworth enjoys almost universal popularity to-day among psychologists; the other mode is utterly discredited. Now, I should like to make clear that, in the present instance at least, all the advantages lie with this second despised mode.

The two modes may be briefly described as follows. The accepted and orthodox one explains a process in terms of its machinery, whereas the other one explains a process primarily in terms of the situation with which the machinery has to deal. In other words, the first mode presupposes that a process is what it is because of the build of its engine; while the second mode presupposes that there is an engine which owes its character, at least in large measure, to the character of the stuff and complication which the engine encounters. Please note that both modes rest upon presuppositions. And please

[1] "A New Experiment in the Psychology of Perception," this JOURNAL, Vol. X., page 505.

note also that, by virtue of this fact, the scientists' ultimate problem concerns the utility of these same primitive assumptions. This should not be lost from mind, inasmuch as the champions of the first mode have the habit of urging in its favor that it is purely empirical, resting upon no metaphysical proposition.

Let us now consider Dr. Hollingworth's facts and his interpretation of them. "*To suggest activity pictorially,*" he says, "*the moving object must always be caught at an actual point of rest; to suggest pose or arrest it must be caught at a point of actual motion.*"[2]

"The amateur usually makes the mistake of supposing that to suggest motion, let us say the motion of a horse trotting, the foot of the animal should be represented in the middle of its course. Nothing is farther from the truth. To suggest action effectively, the foot must be caught at one of the two resting points—either at the initial point, before the beginning of the movement, or at the final point, midway between extension and return."

I am quite certain that Dr. Hollingworth has here touched upon a valuable discovery. I am equally sure that he has overlooked some important features whose omission must seriously alter the general proposition. But I shall not dwell upon the omission until I have considered the main issue. This main issue is squarely presented in Dr. Hollingworth's interpretation of his facts.

"The explanation is simple. The perception of activity is a typical illustration of the process of interpreting a situation in the light of earlier experiences, associations, and memories. The eye can not see while it itself is in motion. Vision is achieved at points of rest, at least the clearest vision is. Because of difficulties of accommodation, adjustment, etc., our clear visions of moving objects come at the moments in which the objects are temporarily at rest. Only when objects are inactive or in attitudes of pose do we ordinarily get clear visual impressions of them in the middle of a conceivable course of movement. Our interpretation of pictorial representations of objects proceeds in terms of these past experiences."

Here we find a straightforward example of the first mode of interpretation. We see clearly when our eyes are at rest; hence we perceive a moving object best when it is at rest. So far, so good, perhaps; but how about the converse instance, the perceiving of a resting object? According to the original law of resting points, we ought never have so clear a perception of a motionless object as we have of a moving one; for we must perceive the still object at a point of *actual motion*, whereas the eye must, at this moment of the object's actual motion, be at rest in order to secure a clear image. There is another way of stating my difficulty. If the eye best perceives when

[2] Page 508.

it itself rests, I can understand why the moving object is most advantageously depicted (imaged) at one of its resting points; but I can not see why a resting object should not also be depicted when at rest, and by the very same arguments. As a matter of fact, I believe that it is best exhibited or fancied when it is seen or thought of in a state of rest. If the process of perceiving rest and motion is to be explained in terms of the eye machinery, ought we not say that we best perceive motion *and* rest at instants when the eyes rest? But let us do this, and Hollingworth's new law collapses. For now we must admit that the eye rests frequently in following the course of a moving object, and hence has clear visions of it during its trajectory, and hence need not wait for clarity until the object has itself reached an instant of rest.

That we do secure *clear* images[3] of moving things during their flights is indisputable. I have never found the slightest vagueness in those stiff and often ludicrous cinematographic records depicting the rigid, straight leg of the pedestrian or the clumsy twist of the trotting horse. I perceive the man as a walking man, the horse as a trotting horse. They are not ambiguous, they are not falsifications. And this, I take it, indicates that I do genuinely perceive men and horses at such awkward instants in their movements. Nevertheless, as Hollingworth correctly insists, these are not the postures which are most effectively chosen to illustrate, either in memory or in some artistic form, the pedestrian or the trotter. But why not? The query can best be answered after I have criticized the orthodox mode of explanation and suggested the merits of the heterodox one.

All the difficulties into which Dr. Hollingworth falls arise, I think, from his prior acceptance of modern psychology's dogma of the engine, if I may be allowed the phrase. Once commit yourself to the presupposition that the peculiarities of perceiving are due *fundamentally* to the structure of the perceiving mechanism, and there is no escape from a host of intolerable obscurities. You may, of course, safely and profitably assume that those peculiarities are, in some measure, due to this mechanism; the peril sets in only when the mechanism is looked to for the first and basic explanations of its own behavior. What this peril is, appears in the inadequacy of Dr. Hollingworth's account of the perceiving of still objects. And to shun it, we have only to choose some other primary presupposition.

Now I shall not attempt to enumerate and test all possible presuppositions, which are many. I shall merely employ one which, in my opinion, is not absolutely inadequate, but nevertheless is much more fruitful than the dogma of the engine. I choose it here because it affords the sharpest contrast to Dr. Hollingworth's explanation.

[3] I am here using the term "image" conventionally.

It is the quasi-rationalistic assumption already described. Let us see how it works.

The perceiving process, according to this assumption, derives its manner predominantly from the objective situation wherein the organism finds itself and toward which it "endeavors" to take a certain attitude, or in which it "seeks" to accomplish something. Now, what is the situation in the present instance? And what is to be accomplished? There is an object in motion which has been seen. The observer resolves to play a game with this object. If he is an artist, it is a two-handed game. He endeavors to accomplish two things at a single instant, *i. e.*, give a *single static* image of it. And this single static image shall be that one which *most effectively* represents the object and its motion to another person. You must observe carefully these two rules of the game. It is their combination which gives us the clue to the technique of both imagery and pictorial art.

The artist's question then is simply this: which single static image is most successful in suggesting the object and its particular motion to a second person? And the answer is to be found in some of the *facts* which Dr. Hollingworth adduces, but not in the theory which he adds to them. The moving object is very frequently (but not always) best depicted at an actual point of rest; and the resting object is most forcibly exhibited not at a point of *actual* motion, but at a point where the object would be in motion, *were it not interrupted.* Dr. Hollingworth's illustrations of this, drawn from classical art and from his valuable and original laboratory experiment, confirm so conclusively the account I give that I can only refer the reader to his article.

How, now, shall the explanation run? Why, very simply, indeed! *Effective imagery, mental and artistic alike, follows the real situation most faithfully, under the rules of the game.* The first rule of the game is that one and only one image shall be used to represent the object. Well, if the image must be one and therefore static, is it not evident that the one image that most faithfully and successfully represents a moving object would represent the object at that point where it is *really* at rest? That image does less violence to facts. The pedestrian's leg is approximately still at the instant of touching or of leaving the ground; and it is still at no other moment. To represent the leg at another instant, then, would be to represent it as still when it is really moving. Such a picture might be *clear;* indeed, it almost always is. But it would not be *effective,* because it would falsify the objective situation.

Likewise with the depicting of a still object, though here another consideration occasionally enters. If you depict a horse with both forelegs in the air and the neck low, you give a picture which falsifies; for the animal in this position is really galloping full tilt. We doubt-

less see horses in that position; but *when we do, we do not see them halt there.* Hence it is that, when we see a picture of a horse at such an instant of flight, we see thwarted motion; and this is the most aggravated variety of rest. It is not simple repose. It is the immobility of terrific tensions in equilibrium.

Several very interesting matters involved in this matter deserve discussion; and not the least among them is that of the hurdler. I think that many observers will agree that the instant of clearing the hurdle is most effective in depicting the activity. But this instant is one of motion, not of rest. How then shall we square it with the explanation just advanced? I think we must say that, under the rules of the game, this is a type of activity which can be adequately depicted by no *real* instant of rest, and hence the most characteristic instant of motion is chosen. But I do not wish to argue the point now. I desire only to emphasize what I regard as the most important theoretical consideration involved in Dr. Hollingworth's suggestive study. The dogma of the engine, so highly favored by our contemporary psychologists, drags its followers into grievous perplexities and artificial conjectures. The derided dogma of the adaptive agent, on the contrary, supplies us with a simple common-sense explanation in a host of cases, and, what is much more decisively in its favor, it can explain those very behaviors of the engine which the adherents of the other dogma use to explain such things as the perception process.

This advantage is remarkably clear in the present instance. Dr. Hollingworth explains the law of the resting point by the pretty well established facts that the eye moves in jerks while following a moving object, and that clearest vision occurs at the rest instants. But the psychologist who accepts the dogma of the adaptive agent can explain these explanations. Suppose that there is an environment. Suppose that in it there are things moving about in physically continuous paths. Suppose that the space of these paths is essentially as the ordinary man and the geometer find it to be. Suppose that light is, too. Then a multitude of propositions follow. Complete definition in a field involves and depends upon a unique determination in space and time; an object, in other words, is least ambiguous (*ceteris paribus*) when its locus and moment are given. This is true not merely in abstract calculation, but none the less in perception. Therefore, the eye sees most determinately when it sees an object at a single place in a single instant. Now suppose that the eye follows a moving thing. The eye does not know in advance the thing's path. In fact, the eye knows nothing whatever. How, then, could it follow continuously the object? The object advances from s to s', being in s at t and in s' at t'. What advance shall the eye make? Shall its

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line of vision go from s to s'? It may happen to, but certainly this move is only one of indefinitely many possible moves. Mathematically, the chances of its moving to some other point are indefinitely great. And logically there is no reason why the move should be from s to s'. Thus it comes about that *the eye actually follows a trajectory in a series of discontinuous tangentials and by the well-known method of trial and error.* As the object moves, the line of vision shifts, usually to some point whither the object does not go. In a very short time this deflective move is checked by off-center vision of the object, as it progresses in some other direction than that taken by the eye. And the eye returns to catch the trial.

All this, I would urge, is the only conceivable mode of perception, if the objective situation really is as geometry and physics and biology describe it. And it explains both the eye's behavior and our preference for the *real* resting points as symbols of a moving thing.

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REVIEWS AND ABSTRACTS OF LITERATURE

Fortschritte der Psychologie und ihrer Anwendungen. 1 Band, VI Heft. KARL MARBE. Inhalt: (1) *Psychologische Gutachten zum Prozess wegen des Müllheimer Eisenbahnunglücks.* Pp. 35. (2) *Kinderaussagen in einem Sittlichkeitsprozess.* Pp. 22. Leipzig: Verlag von B. G. Teubner.

Here are some practical applications of psychology which may have, in their future development, an even more direct bearing upon social welfare than those commercial applications so interestingly commended by Professor Münsterberg in his recent book.

Dr. Marbe, director of the Psychological Institute at Würzburg, was called in as an expert in two cases here reported together, but widely different in character, as their titles will indicate. In the railroad case he was called in by the prosecution; in the other, by the defense. In both cases his side won the verdict. Moreover, it is evident to any one who will read the reports that his expert knowledge was of great importance in influencing the judgment of the court. Insanity experts have become a byword among us. Some would pray to be delivered from a new set of psychology experts; but if all can be as sane and as restrained as Professor Marbe we need not fear.

Case one is concerned with a railroad accident at Müllheim, Baden, when fourteen people were killed, many injured, and much property was destroyed. Contrary to expectation in such cases, the locomotive engineer, the fireman, and the guard (Zugfahrer) were not killed. Their examination upon the subject of the accident began at once.

In general outline the accident is known to all of us through similarity to railroad accidents in the United States. It was the old story of run-

ning past signals, neglect of instructions, and a liberal indulgence in beer, wine, and spirits during the engineer's day's run. It was discovered, also, that the engineer suffered from *incipient* arterial sclerosis of the brain; but this seems to have been opportunely discovered by the defense. The engineer ran into the station at Müllheim disregarding all signals (and German stations are plentifully supplied with them) on to a switch which led abruptly from the main track through a tunnel in the station building, at a speed of one hundred kilometers; whereas twenty kilometers was the prescribed rate for that switch. He had been manifestly "queer" and stupid all day,[1] so that the guard had remarked it; yet neither he nor the fireman, while they knew the danger and their own responsibility under the laws of Baden, did anything to prevent the disaster, except that the fireman shut off steam before the disaster without, however, applying the emergency brake. The guard had attempted to apply the emergency brake too late, and, in his panic, failed, as an investigation after the accident showed.

The state's attorney called upon Dr. Marbe to answer as an expert such questions as the following:

(*a*) (1) Was the fatigued condition of the engineer noticeably greater than that which might have been induced by his labor, the unusual heat (July 17), his incipient sclerosis, etc. (2) Did the use of alcohol weaken his sense of obligation to attend to the progress and safety of his train?

(*b*) Had the guard time in 22 seconds[2] (1) To recognize the ineffectiveness of his engineer, (2) To become clear in his mind that the train was in danger, (3) To bethink him of his duty to interfere, (4) To decide for the emergency brake, and (5) To pull this?

(*c*) How many seconds did the fireman need (1) To represent to himself the delay of the engineer, (2) To become clear as to his own responsibility to avert danger, (3) To decide for the emergency brake, (4) To pull this? and, in view of the fact that the emergency brake should immediately follow shutting off steam (which had taken place), (5) How much time would it take to apply the brake after shutting off the steam?

I may not take time and space to recount the details of the report which covers many pages of a sane, careful, well-balanced investigation: one highly calculated to raise applied psychology in the estimation of public men, especially members of law courts; but a few main points may be indicated.

(*a*) The exact amount of spirituous liquors consumed by the engineer within eighteen hours was ascertained—how, the report does not say. The engineer was certainly a capacious person! This came to a total which on the basis of the usual percentage of alcohol to be found in the

[1] It was known by his guard that he had consumed a large quantity of various alcoholic beverages during the day, but this did not seem to function as a cause of queerness and dumbness.

[2] Had steam been shut off and the emergency brake applied 15 meters before reaching the station signal, the train would have slowed down before the danger-point, and the accident been averted. The estimated time which elapsed between that point and the entrance to the switch was 22 seconds.

various beverages consumed, was put at 178.3 grams of alcohol; and by citing various experiments it was shown pretty conclusively that such an amount would produce even upon a hardened drinker that "tired feeling," sleepiness, and an inhibition of the ordinary reflexes for twenty-four hours or more. In fact, so far as this part of the investigation is concerned, the conditions are too well known to need any comment or any further weight of authority.

The expert psychologist here, as in the whole investigation, declined to enter into the moral judgments or to give causes for the accident; he confined himself to his psychology.

(*b*) More significant is the attention called to the effect of alcohol upon the ordinary power of inhibition which would, in normal conditions, have so influenced the engineer that, even had he been suffering unduly from the heat, illness, etc., he would yet have made an effort to look after the safety of his train.[3]

(*c*) In order to answer the questions relating to the amount of time needed to set brakes, shut off steam, awaken to a sense of responsibility (which would quicken reaction time), etc., etc., the expert had recourse to simplified apparatus in his laboratory, by means of which the essential characteristics of the situation on the wrecked train were reproduced and, as a result of experiments conducted with many persons and instruments measuring very small fractions of a second, it was shown that the time necessary for the guard to observe that the engineer was not fulfiling his duty and then to apply the brake himself, did not exceed 2.5 seconds.

Here the author has, wisely, taken some pains to show that a consciousness process covers a much shorter interval of time than the expression of it. The guard did not need to reflect upon this situation in *words* in order to recognize it.

Allowing for some situation arising for which the guard (or the fireman) could not have been prepared, we add an extra second of time, although some allowance had already been made. Making still further allowance for safety's sake, the total time needed (as shown in the questions of the state's attorney) could not exceed four seconds, whereas there were 22 seconds available.[4] The defense objected that such measurements

[3] Note also the following points made: "Die Art und Weise und wahrscheinlich auch die Zeitpunkt, in welchem der Lokomotivführer seinem Schlafbedurfnis nachgab-diese Dinge waren auf jeden Fall von dem Alkoholgenuss kausal beeinflusst. War nun aber der Alkohol eine "erhebliche" Ursach des Umstandes, dass der Lokomotivführer seinem Schlafbedurfnis nachgab. Das heisst: Hätte der Lokomotivführer nicht vielleicht seinem Schlafbedürfnis auch nachgegeben, wenn es gar keinen Alkohol getrunken hätte? Die Frage, ob der Alkoholgenuss ein erhebliche Ursache für die Nachgiebigkeit des Lokomotivführers gegenüber seinem Schlafbedurfnis war, muss ich mit der allergrössten Wahrscheinlichkeit bejahen." S. 349.

[4] Two other points are to be noticed: (1) Laboratory experiments are made under conditions of moderate attention only. In actual operation of a train much greater attention is normally to be expected. (2) *Cf.* page 359 of the *Fortschritte*. Observe that the guard may have for years entertained a contempt

were all very well for the quiet of the laboratory, but that they could not hold good in actual practise. Amusing ignorance of reaction time was shown—perhaps the expert referred to tenths of a minute! This led to a desire on the part of Dr. Marbe to perform at least a part of the experiment in an actual locomotive of the same type as the one destroyed, with a *Packwagen* for the guard. Such an experiment was carried out through the courtesy of the railroad. The experimenter employed as subjects the regular train crew and used a stop-watch measuring fifths of a second. Results of this experiment triumphantly vindicated the accuracy and propriety of laboratory methods.

This accident occurred on a Monday, according to criminal statistics one of the worst days of the week for reprimands; and its connection with the consumption of alcohol is most significant. Dr. Marbe suggests the manifest duty of railroads to require abstinence from their employees.[5]

As a result of this trial, the engineer was sentenced to two years and four months' imprisonment and costs, the guard received six months and costs, and the fireman merely had to pay the costs, it being considered by the court that the duties of his position were such as to give reasonable excuse for his failure to notice that the engineer had run by the signals.

In the second investigation here reported an unmarried schoolmaster of forty years of age was charged with criminal immorality with seven girl pupils, ten and eleven years of age. The accusation was made originally through anonymous letters, and corroborated by the girls in question at an examination held by the pastor of the village (Pfarrer) who, in Bavaria, is a local school inspector. Later, another examination was made by the police, and in both of these examinations the method of questioning was one which is very startling to Americans. The children were not asked to tell direct stories of what had occurred, but leading and intimate questions of a most revolting character were asked and were to be answered by "yes" or "no." Some of the questions could hardly have been understood by the children, while in others, the power of suggestion was great and fairly demanded false answers. The testimony of children and of young girls approaching puberty, in particular, especially when it relates to sexual matters, is notoriously unreliable. When combined, as here, with this unspeakable method of extracting testimony, the result is shocking indeed. A desire to do away with such methods of investigation is the excuse offered by Dr. Marbe for the nauseous details of this report,

for printed directions, "that sort of instruction," as emanating from people who knew nothing about the matter. He may have been encouraged in his belief by the number of trips taken, free from accident, when yet instructions had been disregarded. In the recent New Haven wreck case, testimony was abundant that running by signals, even in a fog, was common practise.

[5] In this connection note that the great wave of prohibition which has recently swept over the Southern States of this country has been caused by industrial conditions, not morals. Cotton manufacturers and others have found that, under prohibition, they get their workmen back on Monday morning as good as new!

details, the publication of which would be permitted in this country only to medical journals of limited circulation.

The charges were most specific and revolting—always understood that they were not volunteered, but elicited—yet the teacher was triumphantly acquitted by the court on the ground that such testimony was wholly unreliable. Much of it was withdrawn by the girls after they had realized its seriousness, and practically all of it could be traced to two girls (one in particular, whose character was quite untrustworthy and who had infected the others). By suggestion the girls were brought to believe that they had suffered acts of which they had merely heard. Physical examination showed that the outrages to which they had testified had not been committed.

The schoolmaster had not been popular in the village. Moreover, he had manifested at times a reprehensible, but not criminal familiarity of conduct with his pupils. Malicious gossip did the rest.

Of chief significance for us are these points: (1) The services of a trained psychologist, who knew the value of testimony, were called for; and it is his recommendation that there should be present such a trained taker of testimony at every examination and that both questions and answers be taken stenographically. (2) The verdict was influenced by this expert judgment. (3) The value of concurrent testimony was again weakened. (4) Certain reforms in question-putting were demanded. Even in this country undue weight is attached to the testimony of perverted or abnormal children. "For of such is the kingdom of heaven!" One hates to part with such an illusion—but illusion it surely is. All childish testimony is untrustworthy and much of it is bad, if anything is bad.

From the point of view of applied psychology these two cases show how the psychologist may be of signal service to courts without going beyond the proper confines of his profession. The moral aspect of these cases it is more difficult to estimate. In the railroad case some of the proper delinquents received adequate punishment which they have too often escaped, both in this country and abroad—but notably, here. It would be a good thing for the general public if as careful and able an expert could be called in to investigate some recent railroad horrors with a view to fixing responsibility with accuracy, but, after all, society desires not so much to punish the guilty as to avoid future disasters. From this point of view railroad authorities would do well to study the physiological effects of alcohol on reaction times. While railroad employees in this country are not so much given to drinking as those in Germany, there is ample room for improvement.

As to the case of alleged immorality: Doubtless many an innocent man has been condemned upon the testimony of youthful neurotics just because the testimony was clear cut and consistent. Since we now know how false this can be it behooves us to avoid the error.[6]

In the railroad case the court held all three men to have been guilty as charged; but, though fourteen people were killed and many injured, the

[6] Psychologists and moralists should own the entire report and study it. Its scientific character is beyond question.

sentences were not at all those appropriate to manslaughter. This is evidence that society apparently fears less the man who may kill scores or hundreds through besottedness or brutal stupidity than it does one revengeful person with a hot temper. But is society wise?

In the schoolmaster's case, he was justly acquitted of a charge which, had it been sustained, would have brought upon him severest punishment, removal from his place and the ruin of his career; but it is not clear that, even then, anything could have been accomplished to prevent future evils of the same kind.

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Das Weltproblem. J. PETZOLDT. Zweite Auflage. Leipzig und Berlin: B. G. Teubner. 1912. Pp. xii + 210.

This book is so suggestive and interesting that a second review of it will not be superfluous.[1] It is a small book on a great theme, a thing to be grateful for, and it is written with enthusiasm for a fine cause. That cause is twofold, the emancipation of our imagination from an academic tradition, and loyalty to a too little known thinker, Richard Avenarius. Readers of Avenarius, particularly of "der menschliche Weltbegriff," will find much that they are familiar with, especially the theory of "introjection," to which Petzoldt gives a more extensive application. This rehandling of the theory of introjection is of particular interest. There has been, we may say, a first and a second introjection; the first was the introjection of spirits, the second was the introjection of substance. The first was described by Avenarius, who calls our attention to the fact that primitive folk take quite naturally for granted, not as theoretical inferences, but as simply and normally experienced, the existence of *mana,* souls, spirits, and gods, and that much recent and contemporary philosophical confusion has resulted from the fact that, to a certain important extent, we operate unconsciously with an intellectual apparatus derived from animistic sources. In what we call conventionally "primitive culture" imagination seems to be mass imagination; there is no individual inquiry. The tales about things in general are instances of local mythology.

To break through this crust of aministic preconception requires a remarkable individual or a series of happy circumstances. Petzoldt takes the name of Thales as that of the first empiricist and positivist. For to substitute any *"Urstoff,"* provided by nature for the ἀρχαί of mythology was to be, in spirit, at least, an empiricist and a positivist. But the appeal from spirit to matter involved its own fatality, namely, the distinction between the screen of empirical "accidents" and the substance that hides behind them, together with the attribution of importance to the latter. The artifice of every philosophy that seeks the heart of things by an *"Aufhebung"* of empirical nature is prepared for in the introjection of substance.

[1] The first edition was reviewed in this JOURNAL, Vol. IV., page 582, by Professor C. H. Rieber.

The history of the substance idea need not be here pursued. Petzoldt reviews it swiftly and polemically. His purpose is critical, not primarily historical, and what he has to say must come between the covers of a small book. The virtue of brevity may well atone for an impression of historical dogmatism, particularly inasmuch as historical issues that might be raised do not obscure the essential thesis. Somehow or other the introjection of substance was brought about. It is the business of the history of philosophy to tell how this happened. In any case, the search for substance has encouraged indifference to facts; the theoretical faith in it has been an excuse for actual ignorance.

Two thinkers there have been, according to Petzoldt, who might have freed philosophy from the substance tradition, Protagoras and Hume. Protagoras was willing that every one should describe things as he finds them. That does not preclude the comparison of different descriptions, and the discovery that one sincere description is better than another one no less sincere. Hume's empiricism was less complete, since he discussed the substance problem. He nearly laid the ghost, but not quite. He left unswept up the clutter of mental states that has given us in our own day "the stream of thought" which William James might also have characterized as "the faint rumor left behind by the disappearing soul upon the air of philosophy."

Petzoldt speaks of Kant and his British predecessors in a way that German writers are not wont to do. It is, he claims, philosophical injustice that the influence of Kant still exceeds that of Hume. If only Locke, Berkeley, and Hume had been studied with the same zeal that has been devoted to Kant we should now be better off because (here I interpret) the concept of substance would, with good luck, have been decently interred instead of being piously perpetuated as the *Ding an sich* and the *Ich an sich*.

Petzoldt is at pains to insist upon the logical fallacy involved in reducing all existence to one type of substance which receives its meaning and its name from its empirical character and its relation to other types of existence. A problem which demands for its solution the discovery of the single nature of all there is, the problem whether the world is all this or all that or all something else, is, he insists, a problem of the most artificial and contradictory type. *"Nach der Welt an sich fragen ist schlimmer als die Quadratur des Zirkels und das perpetuum mobile suchen"* (p. 199). Such questions are answered when they are understood.

The word substance, like the word soul, has not, of late years, been heard often in philosophy, but have we been so free of the idea? Have we not been continually called upon to discuss reality that inexplicably hides its face, or to substitute for the face of nature its precise reduplication? It is clear that the idealists argue for a theory of substance. Do the realists, for instance, argue for another? Can a problem of to-day be identified as a problem of substance, or is it freely and professedly a problem of the interdependence of empirical facts? This is the test proposed by an unusually stimulating little book.

COLUMBIA UNIVERSITY. WENDELL T. BUSH.

The Elements of Psychology. DAVID R. MAJOR. Columbus, Ohio: R. G. Adams and Company. 1913. Pp. xiii + 413.

To make general psychology more palatable to the beginning student is what the author modestly set out to do, being conscious of the "winter of our discontent" in the realm of psychology books. Among his motives for the undertaking is that of rearrangement, to proceed "after the manner of the eclectic without special regard to the systematic agreement of the topics and matter selected" (III.). He desires to avoid championship of any given principles of interpretation as structural or functional.

In the opinion of the reviewer such renunciation was not educationally a justifiable procedure. Students *should* be conscious when studying a text of "a systematic agreement of the topics and matter selected." But fortunately the author does not err in carrying out his own principle of eclecticism, since, after all, his presentation of material is in general agreement with the traditional order and content. In style the book is distinctly less palatable than some of its forebears and errs on the score of what might be called the American sin of over-obvious spiritual pabulum. We have on page 299, for instance, the following: "It is one of the most familiar of our experiences that success in our undertakings gives pleasure and that defeat brings pain. . . . The whole round of life, from the eager games and contests of childhood and youth to the most serious concerns of mature life, is run through and through with the joys of success and the anguish of defeat. Likewise whatever conditions favour the attainment of a desired object or aim are pleasant; those which thwart its attainment, unpleasant. Hence, *e. g.*, the joy in the full purse and its power to provide the summer outings, or to purchase the coveted set of books, or the collection of rare pictures; hence the pangs of poverty and the inability to obtain a fair portion of this world's goods." This will serve as an example of many pages.

Is it not appropriate that psychologists should claim some kindred with the poets in giving scope for the play of a reader's intelligence? And is it not to invite mediocrity of scholarship if one present as learning that which is the common property of the uninstructed mind, he who runs being able to read? In the opinion of the present writer it is time that our text-books be made less popular and more scientific as being more concerned with principles and with only such facts as may be construed to have a bearing upon principles or upon less obvious generalizations of facts. And "scientific" here need not mean sins against our esthetic sense. Undoubtedly one of the causes for our American repute in exact scholarship is the popular text.

Both as to principles and facts the author is guilty of inaccuracies. For instance, the "modern teaching" concerning the relation of mind and body, psycho-physical parallelism, "now supported by a mass of evidence so convincing that there is little likelihood that it will require revision in any important respect" is defined as the doctrine that "our mental life is intimately related to *and dependent upon changes in the nervous system*"[1] (p. 15). As example of inaccuracies as to fact the

[1] Italics the present reviewer's.

diagram (p. 47) to illustrate the functions of the cord represents *both* sensory and motor nerves as posterior (or anterior). For such lack of scholarship there is, of course, no excuse.

Though this review is largely negative the present writer is not oblivious of the merits of Professor Major's book. He attains a clear and concrete description, states issues, for the most part without bias, has a style which escapes being heavy, and on the whole presents a text which will be of assistance to many who study psychology from a popular point of view.

JOHN WARBEKE.

MOUNT HOLYOKE COLLEGE.

JOURNALS AND NEW BOOKS

REVUE DE PHILOSOPHIE. May, June, and July, 1913. This triple number, the second part of the supplement of the *Revue* for the current year, brings to a close the analysis of types of the religious consciousness within the Catholic Church. An abstract of the first part of this work was given in this JOURNAL, Vol. X., page 277. *La Compagnie de Jésus* (pp. 445–488): A. BROU. – Under the rigorous discipline of Saint Ignatius, the Jesuits, in their various stations of service, gain a spiritual strength which brings them great inner freedom from self and nearness to God. *Saint Vincent de Paul* (pp. 489–509): J. CALVET. – Saint Vincent de Paul had little of the ecstatic in his make-up, but with a clear and humble faith he inclined his will to the commands of God and worshiped him by his deeds. He was not of the quietistic, but of the active type. *Les premières Dames de Charité au XVII^e siècle* (pp. 510–546): MGR. DEMIMUID. – An account of Marie de Gonzague, Queen of Poland, the Duchess of Aiguillon, and Mme. de Miramion as types of the three classes of women in the Dames de Charité in the eighteenth century. *Le Bienheureux Curé d'Ars* (pp. 546–558): S. G. MGR. MONESTÈS. – The Curé d'Ars, who unceasingly cultivated the passive virtues of meditation and adoration, is given as an example of the type most helpful in ministering to the spiritual wants of others. *Un sauvage converti* (pp. 559–574): J. DARNAND. – A sketch of Mataafa, who was converted and manifested his faith by denying himself to save his people. *La vie intime du catholique* (pp. 575–615): J.-V. BAINVEL. – The intimate life of the Catholic is one of perfect humility and of happiness in the love of God. *Les mystiques interprétés par les mystiques* (pp. 616–660): J. PACHEU. – Extracts from the mystics showing belief in an inner heart or core of the soul, which is the meeting place with God in mystic ecstasy. *Le chant religieux catholique* (pp. 661–691): C. BESSE. – The chant is treated as one of the effective agencies for the cultivation of the religious life. *La liturgie catholique* (pp. 692–886): DOM M. FESTUGIÈRE. – An elaborate and interesting defense of the place of the cult in the religious life.

REVUE DE MÉTAPHYSIQUE ET DE MORALE. May, 1913. *L'objet et la méthode de l'analyse mathématique* (pp. 307–328): P. BOU-

TROUX. – Analysis always ends in a new construction, thus the ellipse no longer appears as a collection of points, but as a sort of "Leibnizian monad," or a "law." Analysis "does not, then, make synthesis useless, but serves as a preface and condition to it." *Esthétique et sociologie* (pp. 329–371): G. GASTINEL. – A criticism of Chas. Lalo's *Introduction à l'esthétique* which has as its grounds the looseness of the sociological method. *Sur la vie intérieure* (pp. 372–389): F. D'HAUTEFEUILLE. – A study of the importance and nature of the inner life and of its relations to the domain of morality. *Etudes critiques. La philosophie de Georg Simmel:* A. MAMELET. *Questions pratiques. Le suicide:* G. CANTECOR. *Supplément.*

Carus, Paul. The Mechanistic Principle and the Non-Mechanical: An Inquiry into Fundamentals with Extracts from Representatives of Either Side. Chicago and London: The Open Court Publishing Company. 1913. Pp. iv + 125. $1.00.

Del Vecchio, Giorgio. Der Fortschrift im Recht. Berlin and Leipzig: Dr. Walther Rothschild. 1913. Pp. 4.

Del Vecchio, Giorgio. La Ciencia del Derecho Universal Comparado. Madrid: Hijos de Reus. 1911. Pp. 35.

Del Vecchio, Giorgio. Il Concetto del Diritto. Bologna: Nicola Zanichelli. 1912. Pp. 155.

Del Vecchio, Giorgio. De la Guerra y la Paz. Madrid: Hijos de Reus. 1912. Pp. 171.

NOTES AND NEWS

LETTER FROM MR. PARTRIDGE

TO THE EDITORS OF THE JOURNAL OF PHILOSOPHY, PSYCHOLOGY, AND SCIENTIFIC METHODS:

Will you kindly allow me to make, through your JOURNAL, an explanation in regard to my "Reading Book in Modern Philosophy," which was published in September? My work of revising was hurried, and in some way my final corrections were either received too late or were overlooked by the printer. The fault was mine, for revision should not have been undertaken in so short a time as was allowed me. I did not discover the condition of the book until a large part of the edition had been distributed. To those who have copies I should like to announce that a list of corrections has been prepared, and that the many minor imperfections in the book will be eliminated in a second edition, which will be issued soon, if the general plan of the work seems to meet the needs of teachers.

Very truly yours,

G. E. PARTRIDGE

ON November 20, the Philadelphia Pathological Society held, at the College of Physicians, a symposium on the subject of "Physical Growth and Mental Development." The speakers were Dr. H. H. Donaldson, of

the Wistar Institute, "Studies on the Growth of the Central Nervous System"; Professor Bird T. Baldwin, of Swarthmore College, "The Normal Child; Its Physical Growth and Mental Maturity," and Professor Lightner Witmer, of the University of Pennsylvania, "Children with Mental Defects Distinguished from Mentally Defective Children." The discussion was opened by Dr. H. H. Goddard, of the New Jersey Training School, Vineland, N. J., Dr. Charles Burr, of Philadelphia, and Professor J. H. Leuba, of Bryn Mawr College.

PROFESSOR JOSIAH ROYCE calls attention to the following typographical errors in his article on "An Extension of the Algebra of Logic" which appeared in the last issue of this JOURNAL: On page 624, first line, for abd, read $a\bar{b}d$; seventeenth line, at end, for $(cd; \bar{a}b)$, read $(cd; \bar{a}\bar{b})$; sixth line from bottom, the right hand member of the equation, for $(ab; dc)$, read $(ab; \bar{d}c)$. On page 627, sixth line from the bottom, for abd, read $a\bar{b}d$. On page 628, third line from the bottom, for $gh\bar{e}$, read $g\bar{h}\bar{e}$. On page 629, the fifteenth line, read

$$\frac{a}{\bar{b}} \circ \left(\frac{c}{\bar{d}} \circ \frac{e}{f} \right) = \frac{u}{v}.$$

On page 633, sixteenth line from bottom, for h/g, read $h/\bar{g}$.

THE New York branch of the American Psychological Association will meet in conjunction with the Section of Anthropology and Psychology of the New York Academy of Sciences on Monday, November 24, at 8:00 P. M. at Columbia University. The following papers will be read: "Measurements of Accuracy of Judgment," Mr. Richard H. Paynter; "Professor Thorndike's Attack on the Ideo-Motor Theory, Professor W. P. Montague; "The Character of Ideas," Dr. J. P. Turner; "The Color Vision of Animals," Mrs. Christine Ladd-Franklin.

AT the Fourth International Congress on School Hygiene at Buffalo on August 20, Dr. C. E. Ferree, of Bryn Mawr College, read a paper entitled "The Efficiency of the Eye under Different Systems of Illumination"; and at the Seventh Annual Convention of the Illuminating Engineering Society held at Pittsburgh on September 23, he spoke on "The Efficiency of the Eye under Different Systems of Illumination: The Effect of Variations in Distribution and Intensity."

THE annual joint meeting of the American Anthropological Association and the American Folk-lore Society will be held in the American Museum of Natural History, New York City, December 29–31. Titles of papers and abstracts should be sent, not later than December 1, to Professor George Grant MacCurdy, Yale University Museum, New Haven, Conn., who is responsible for the joint programme. The programme will be mailed to members about December 10.

IN the absence of Professor Warner Fite, who is lecturing at Stanford University, his work at the University of Indiana is in charge of Dr. A. C. Mohr, of Chicago University.

THE meeting of the Conference on Legal and Social Philosophy to be held at the University of Chicago has been postponed to April 10 and 11.